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A Letter from William Edgeworth, Esq. Civil Engineer, to Alexander Nimmo, Esq. Civil Engineer, M.R.I.A. communicated by Mr. Nimmo.

Read January 1, 1823.

Dublin, January 1, 1823.

DEAR SIR,

AT your request I send you an account of a few of the principal triangles upon which the map of the county of Roscommon was constructed.

I have calculated the sides from a base measured on the road from Longford to Edgeworthstown, an account of which was published in my father's Report on the Bog District, No. 7, and, with a diagram of some triangles, is to be found in the Second Report of the Commissioners for improving Bogs in Ireland.

On my map of the county of Longford I have published the principal triangles upon which it was founded; and the latitude was determined from observations of the pole star, with an instrument of sixteen inches diameter, that Major Taylor most kindly lent to me.

The longitude of Edgeworthstown was determined from the Observatory of Dublin, by the valuable assistance of Dr. Brinkley, who was so good as to make corresponding observations of white-lights and explosions of gunpowder; four in one night agreed with the mean, within a second of time.

So that the longitude of the stations in the county of Longford may be considered as certain within a furlong. I have connected the triangulation through Roscommon with some of the stations made use of by Mr. Bald in his excellent map of Mayo.

Even with the slight data, that I can now give, the difference of latitude and longitude of the east and west coast of this island is known within a few seconds of time. The principal angles in Roscommon I took in the year 1814, with a six inch theodolite made by Troughton.

But I am now in possession of a repeating circle of eighteen inches diameter of his make ; and a repeating theodolite of Reich-enback, which, from the trials that Major Colby and Captain Kater kindly encouraged me to make of this instrument, at some of the trigonometrical stations in England, in comparison with the celebrated theodolite of Ramsden, I think I could be as certain of an angle to two seconds, as formerly I was to twenty seconds.

So that it would be well worth while to employ this repeating theodolite to correct, by a few well chosen triangles, Galway and Sligo with Dublin, and to determine exactly the distance on the meridian between Dublin and Armagh Observatories. A few more triangles would connect Armagh with the stations on the coast of Ireland, which have been intersected by Major Colby.

If I were to give a diagram of all the triangles that I determined in Roscommon, you would find a station nearly in every square mile, as my object was to secure the accuracy of the map.

The manner in which I laid down the triangles on paper may be found useful to those few who are employed in similar labors. After having carefully drawn mile squares of four inches asunder, and laid down a long base, I made use of a nine inch protractor of Troughton's, with extending conical points. Over one of these

points I placed a little pin hole in thin brass, so that I could see the opposite point through it; and, instead of marking the paper with the points, I intersected a little square cube with a fine perpendicular line marked on it, where the station to be determined was likely to come. I moved it back and forwards, till the protractor, when set to the division, showed where the line should be drawn, which I did without taking up the protractor. In this way I marked every station round, at once, from the angles in the field book.

This may be called surveying on paper, as I made use of the protractor in laying down the angles, as I had done the theodolite in the field.

And when the paper was kept of equal dryness in the large triangles, I could perceive an error of a minute.

I here give you a table of the angles to twenty seconds, and the sides calculated in feet, with the latitudes and longitudes of a few of the stations.

I am, dear Sir,

Your's sincerely,

WILLIAM EDGEWORTH.

*Distance from Lanesborough windmill to Cairneclanugh 77045 feet,
by 2d Report on the Bogs.*

Names of Stations.	Angles.	Distances
		Feet.
Lanesborough	93.45. 0	
Cairneclanugh	18.23. 0	
Slievebawn	67.52. 0	
Slievebawn from { Lanesboro Cairneclh.		26231 52996
Cairneclanugh	31.36.30	
Slievebawn	95.56. 0	
Elphin palace	62.37.30	
Elphin from { Cairneclh. Slieveb.		104112 54860
Cairneclanugh	49.47.40	
Elphin . . .	78. 9. 0	
Moydow . . .	52. 3.20	
Moydow { Cairneclh. Elphin		129207 100829
The angle at Elphin palace, between Moydow and Bishop Law's, Moydow line . . .		3.25.20
Elphin . . .	91.20.20	
Moydow* . . .	31.57. 0	
Fairymount Clump	56.42.40	
Fairymount from { Elphin Moydow		63830 120588

Names of Stations.	Angles.	Distances
Moydow*	38. 1.20	
Fairymount . .	72.21.40	
Slieve Dert . .	69.37. 0	
Slieve Dert from { Moydow Fairymnt.		122594 79240
Fairymount . .	9. 9.20	
Slieve Dert . .	40.53. 0	
Kiltulla, West Stone	129.57.40	
Kiltulla from { SlieveDt. Fairymnt.		16450 67665
By Mr. Bald's base in the east of Mayo . . .		67728
By his Lough Carra base . .		67473
Names of Stations.	Latitude.	Longi- tude.
Lanesborough . .	53.40. 1	7.55.58
Elphin . . .	53.50.56	8. 8.31
Fairymount . .	53.50.32	8.26.15
Kiltulla . . .	53.42.47	8.39.43
Slieve Dert . .	53.40.51	8.39.22
Moydow . . .	53.34.24	8. 6.51
Slievebawn . .	53.48. 4	8. 1. 7

* The angles at this station were not observed.

Names of Stations.	Latitude.	Longitude.
Castlebar Spire .	53.51.15	9.14.54
Croaghpatrick .	53.45.32	9.36.28
Mulrea . .	53.38. 8	9.46.44
Clare Island Light House	53.49.32	9.55.55
Achill Head .	53.58.13	10.12.25
Mullet tower .	54.15.22	9.54.38
Glinak tower .	54.18.46	9.33.58
Downpatrick Head	54.19.36	9.17.59

I have calculated the above, from intersections that I took of Croaghpatrick, in connection with Mr. Bald's triangulation of Mayo. The radius of the equator taken at 20918230 feet, and the ellipticity $\frac{1}{298}$.